

OBSERVATIONS OF HABITAT USE AND ABUNDANCE OF FISH SPECIES OVER A 15 YEAR PERIOD AT METTAM'S POOL

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ABSTRACT

Observations were made on habitat use and yearly variation in the abundance of fish species over a 15 year period at Mettam's Pool in the Marmion Marine Park. Sixty three species were recorded of which almost all have a primarily temperate distribution. Labridae was the most species rich family. Fish species could be categorised into occurring as residents, transient adults or juveniles only. Species present only as juveniles tended to vary greatly in abundance between years and showed a tendency of decreasing abundance through the summer due to mortality or migration.

INTRODUCTION

The Perth area contains a predominantly temperate marine fish fauna (Kendrick, 1999; Hutchins, 2001b) that remains in the most part poorly studied. Mettam's Pool is part of a nearshore reef in Perth's Marmion Marine Park. Repeated observations made by snorkelling during each summer from the summer of 1991/1992 to 2006/2007 have provided the opportunity to provide details of the species occupying this area,

their local habitat use and yearly fluctuations in abundance. Nomenclature follows Hutchins (2001a).

Study Site

Mettam's Pool (31° 52' S 115° 45' E) consists of a reef platform with a sandy pool in the centre and patches of broken reef. The reef platform contains a diversity of algae and some patches of the seagrass *Halophila ovalis*. Towards the outer edge, the reef platform becomes increasingly dominated

by sessile invertebrates and less so by algae. On the western side of the reef platform the depth drops to around 3m and the sea floor is covered in beds of *Ecklonia radiata* and *Sargassum*. On the northern side of the reef platform is an area of relatively shallow broken reef that due to stronger wave action contains few algae other than *Sargassum*.

Approximately 120 surveys were undertaken between the summer of 1991/1992 and 2006/2007. All surveys were made by snorkelling and ranged between 20 and 60 minutes in duration. The majority of surveys took place between November and April. Greatest survey effort was in the area within the reef platform, with forays beyond the reef platform only taking place on days that were particularly calm or of high visibility. Occasional checks of the shoreline for beachwashed specimens were made in all seasons.

ANNOTATED LIST

HETERODONTIDAE

Port Jackson Shark, *Heterodontus portusjacksoni*

Rare. One juvenile recorded close inshore (January 1993) and a large adult found entangled with fishing wire on the outer reef (February 1999).

ORECTOLOBIDAE

Western Wobbegong, *Orectolobus* species

Rare. One adult recorded amongst broken reef outside the reef platform in January 2001.

RHINOBATIDAE

Fiddler Ray, *Trygnorrhina fasciata*
Rare. One adult recorded in broken reef and weed close to shore in February 2002.

DASYATIDIDAE

Smooth Stingray, *Dasyatis brevicaudata*
Scarce visitor, generally along the shore or in the deep water outside the reef platform.

MYLIOBATIDIDAE

Eagle Ray, *Myliobatus australis*
Uncommon. Adults visit the broken reef and sand patches close inshore.

UROLOPHIDAE

Striped Stingaree, *Trygonopectera ovalis*
Common in all habitats except for the flat of the reef platform.

CLUPEIDAE

Pilchard, *Sardinops neopilchardus*
Rare. One small school of juveniles seen over deep water on the outer edge of the reef platform in February 2005.

Blue Sprat, *Hyperlophus vittatus*
Uncommon. Small schools occur close to shore and at the outer edge of the reef platform.

PLOTOSIDAE

Cobbler, *Cnidoglanis macrocephalus*
Common to uncommon resi-

dent, with abundance varying between years. Usually seen in broken areas of reef inshore. Small numbers of juveniles occasionally encountered secluded deep under ledges. Usually only adults observed feeding in the open.

HEMIRAMPHIDAE

Southern Sea Garfish, *Hyporhamphus melanochir*
Common in schools of up to 20 over broken areas within the reef platform or on higher tides over the reef platform itself. Schools tend to contain similar sized individuals.

ATHERINIDAE

Ogilby's Hardyhead, *Atherinomorus ogilbyi*
Common to abundant over sandy areas inshore. Schools can number up to several thousand individuals.

PLATYCEPHALIDAE

Long-spined Flathead, *Platycephalus longispinis*
Rare. One adult seen in the main pool in January 2005.

Southern Blue-spotted Flathead, *Platycephalus speculator*
Juveniles uncommon on sandy bottoms inshore. On rare occasions large adults have also been recorded.

SERRANIDAE

Leopard Perch, *Acanthistius pardalotus*
Rare. One record of an adult in a

crevice in the reef platform in February 2002.

Fusilier Sweep, *Caesiocorpius theagenes*
Uncommon. Schools of juveniles occur over raised areas of reef offshore from the reef platform.

TERAPONIDAE

Sea Trumpeter, *Pelsartia humeralis*
Uncommon. A group of five juveniles was present in broken reef and weed over the summer of 2001/02. While each fish grew notably larger through the summer, the group progressively reduced in number. A group of 20 very small juveniles was recorded in shallow broken reef and weed in January 2007.

SILLAGINIDAE

Yellow-finned Whiting, *Sillago schomburgkii*
Both juveniles and adults are common over sandy bottoms.

School Whiting, *Sillago bassensis*
Juveniles uncommon over sandy bottoms inshore.

ARRIPIDAE

Australian Herring, *Arripis georgiana*
Uncommon in small schools within the reef platform. Common in small numbers over deep water adjacent to the reef platform.

SPARIDAE

Tarwhine, *Rhabdosargus sarba*
Common in small schools within and outside the reef platform.

HAEMULIDAE

Gold-spotted Sweetlips, *Plectorhinchus flavomaculatus*
Rare. One adult recorded outside the reef platform in January 2001.

MULLIDAE

Blackspot Goatfish, *Parupeneus spilurus*
Rare to common. Small schools of juveniles are present in some years and appear to remain resident within the reef platform. Most records were from the early and mid 1990s and recently this species has not been recorded.

Blue-spotted Goatfish, *Upeneichthys vlamingii*
Single adults are common in bare patches of sand and rubble amongst the kelp beds offshore from the reef platform.

MONODACTYLIDAE

Woodward's Pomfret, *Schuetta woodwardi*
Common in schools in deep water fringing the reef platform. Sizes range from juveniles only a few centimetres in length to adults. The larger schools comprise of adults. There is a tendency for all the fish within a school to be of a similar size. Schools of juveniles tend to be in more sheltered areas, including within the reef platform.

PEMPHERIDIDAE

Rough Bullseye, *Pempheris klunzingeri*
Common. Occurs in small schools under the ledges around

the periphery of the reef platform.

KYPHOSIDAE

Western Rock Blackfish, *Girella tephraeops*
Rare. Two records of adults, from the summer of 1997/98.

Zebra Fish, *Girella zebra*
Uncommon. Occurs in small schools, generally on the area of broken reef to the north of the reef platform.

Western Buffalo Bream, *Kyphosus cornelii*
Common in some years, generally offshore. The majority of individuals observed were juveniles.

Common Buffalo Bream, *Kyphosus sydneyanus*
Abundant in deeper waters within the reef platform and in the broken reef on its outer edge. The largest individuals are generally restricted to outside the reef platform.

Stripey, *Microcanthus strigatus*
Uncommon. Occurs in schools of both juveniles and adults under ledges on the outer edge of the reef platform. Occasional inshore.

Moonlighter, *Tilodon sexfasciatum*
Common. Juveniles occur under ledges or in dense weed within the reef platform, while adults occur outside the reef platform.

SCORPIDIDAE

Banded Sweep, *Scorpiis georgianus*
Common in all habitats except for the flat of the reef platform.

CHAETODONTIDAE

Truncate Coralfish, *Chelmonops curiosus*

Rare. Juveniles scarce inshore, sheltering under ledges. One adult was present offshore from the reef platform from December 2006 to January 2007.

ENOPLOSIDAE

Old Wives, *Enoplosus armatus*

Juveniles common within the reef platform. Groups tend to reduce in size during the summer. On rare occasions adults have spent the summer largely within the reef platform. Single adults are commonly seen in the kelp beds offshore.

POMACENTRIDAE

Common Scalyfin, *Parma mccullochi*

Common within the reef platform. Most abundant of the scalyfins.

Victorian Scalyfin, *Parma victoriae*

Rare. One record from February 2003.

Western Scalyfin, *Parma occidentalis*

Uncommon in the deep water adjacent to the reef platform.

CHEILODACTYLIDAE

Red-lipped Morwong, *Cheilodactylus rubrolabiatus*

Abundant inshore, common outside the reef platform.

Crested Morwong, *Cheilodactylus gibbosus*

Uncommon within the reef platform.

Dusky Morwong, *Dactylophora nigricans*

Scarce. Two records of adults from outside the reef platform during the summer of 2005/2006 and one record from March 2007

MUGILIDAE

Yelloweye Mullet, *Aldrichetta forsteri*

Uncommon. Occurs in small groups over *Halophila ovalis* beds on the reef platform in autumn.

Sea Mullet, *Mugil cephalus*

Adults common in small schools over areas of sand and weed within the reef platform.

SPHYRAENIDAE

Snook, *Sphyræna novaehollandiae*

Rare. One adult recorded inshore in March 2002

LABRIDAE

Western King Wrasse, *Coris auricularis*

Females are uncommon in the kelp beds offshore from the reef platform. Juveniles are rare in protected areas within the reef platform.

Brownfield's Wrasse, *Halichoeres brownfieldi*

Groups abundant inshore in areas with both sand and weed.

Black-spotted Wrasse, *Austrolabrus maculatus*

Uncommon under ledges on the outer edge of the reef platform.

It is difficult to judge the true abundance of the species because of its shy nature.

Castelnau's Wrasse, *Dotalabrus aurantiacus*

Rare. Two adults recorded from an area of broken reef and weed close to shore in the summer of 2001/02.

Little Rainbow Wrasse, *Dotalabrus alleni*

Common in relatively exposed weed and reef areas.

False Senator Wrasse, *Pictilabrus viridis*

Common on the outer edge of the reef platform and to a lesser extent in the adjoining kelp beds.

Brown-spotted Wrasse, *Notolabrus parilus*

Abundant. Numbers greatest within the reef platform.

ODACIDAE

Herring Cale, *Odax cyanomelas*

Common in the beds of *Ecklonia radiata* offshore from the reef platform.

PINGUIPEDIDAE

Wavy Grubfish, *Parapercis haackei*

Common on areas of sand and rubble.

BLENNIIDAE

False Tasmanian Blenny, *Parablennius postoculomaculatus*

Uncommon on the reef platform.

Black Blenny, *Cirripectes hutchinsi*

Rare. One adult recorded from

the outer tip of the reef platform in February 2002.

Germain's Blenny, *Omobranchus germaini*

Common on inshore areas of the reef platform.

TRIPTERYGIIDAE

Black throated Threefin, *Helcogramma decurrens*

Common inshore on reef and rubble. Present in clear patches among the *E. radiata* beds offshore but numbers difficult to estimate due a combination of depth, small size and being a bottom-dwelling species.

CALLIONYMIDAE

Goodlad's Stinkfish, *Callionymus goodladi*

Occurrence irregular, but common at times. Inhabits the sandy bottom of the main pool.

GOBIIDAE

Twospot Goby, *Eviota bimaculata*

Rare within the reef platform. Because adults only reach a maximum of 2.8cm (Hutchins & Thompson, 1983) and are difficult to detect, the real abundance may be considerably higher.

MONOCANTHIDAE

Pygmy Leatherjacket, *Brachaluteres jacksonianus*

Rare. One record (green colour form) from a patch of seagrass and weed growing on the reef platform.

Horseshoe Leatherjacket, *Meuschenia hippocrepis*

Juveniles common. On rare occasions large juveniles and adults have been seen under ledges inshore.

OSTRACIIDAE

White-barred Boxfish,
Anoplocapros lenticularis

Rare. Two records, one of a beach-washed adult male during July 2001 and the second of a juvenile in an area of broken reef in March 2005.

TETRAODONTIDAE

Common Blowfish, *Torquigener pleurogramma*

Abundant inshore over sand and rubble.

DIODONTIDAE

Globe Fish, *Diodon nicthemerus*

Rare. Two records of beach-washed adults in July 2000 and May 2007.

DISCUSSION

Mettam's Pool contains a mostly temperate fauna with only three species (Germain's Blenny, Blackspot Goatfish and Gold-spotted Sweetlip) out of the 63 recorded classed as tropical according to Hutchins (1991). The abundance of Germain's Blenny and the presence of all age classes, suggests it is a breeding resident. The status of the Blackspot Goatfish populations remains unclear. While in the present study and Hutchins (1991), only juveniles were recorded from Perth, adults have been recorded

at South Cottesloe (pers. obs.). Similarly, adult Gold-spotted Sweetlip have been reported in the present study and at Hillarys (pers. obs.). Rather than being vagrants, there may be resident populations of both of these species in Perth waters.

As is typical of Western Australian temperate reefs, the most species rich family at Mettam's Pool is the Labridae (eg. Hutchins, 2001b; Harman *et al.*, 2003). Of the seven species recorded at Mettam's Pool, five are regularly recorded. While all species occur in the broken reef outside the reef platform, the habitat in which they are most abundant varies; False Senator Wrasse: outer edge of the reef platform, King Wrasse: deep water around the reef platform, Brownfield's Wrasse: areas of sand adjacent to weed, Little Rainbow Wrasse: broken reef with moderately higher wave action and abundant algae, Brown-spotted Wrasse: little preference but through their large size may exploit different prey to the other wrasses. As such, the wrasses may co-occur by partitioning the habitats within the reef platform.

The fish species of Mettam's Pool can be broadly categorised into residents, transient adults and those present temporarily as juveniles. Residents include species such as the Red-lipped Morwong, Wavy Grubfish, Western Scalyfin and several species of Wrasse. The transient adults group include the Dusky

Morwong, Southern Blue-spotted Flathead and Leopard Perch. These individuals could represent wanderers from more off-shore reef or may occur at low density along inshore reefs.

The species present mostly as juveniles tend to show pronounced yearly fluctuation in abundance. This group contains the Old Wives, Blackspot Goatfish and Sea Trumpeter. The tendency for the juveniles to remain in a similar part of the reef enables the cohort to be tracked through the summer. The trend in all species is decreasing numbers of juveniles through the summer coupled with a gradual increase in size of those remaining. This observation can be explained by either mortality during the summer or migration.

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